MDX-100

SERVICE MANUAL

US Model
Canadian Model
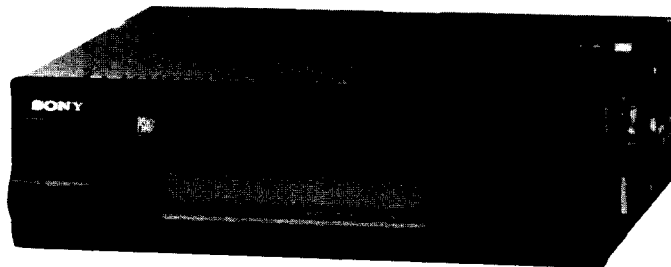
Model Name Using Similar Mechanism	MDX-U1
Tape Transport Mechanism Type	KMS-150A

SPECIFICATIONS

MiniDisc section

Signal-to-noise ratio   90 dB
Frequency response   20 – 20,000 Hz
Wow and flutter   Below measurable limit
Laser Diode Properties
  Material   GaAlAs
  Wavelength   780 nm
  Emission duration   Continuous
  Laser output power   Less than 44.6 μW*

* This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block.

Tuner section

FM

Tuning range   87.5 – 107.9 MHz
Antenna terminal   External antenna connector
Intermediate frequency
              10.7 MHz
Usable sensitivity   8 dBf (75 ohms)
Selectivity   75 dB at 400 kHz
Signal-to-noise ratio   65 dB (stereo), 70 dB (mono)
Harmonic distortion at 1 kHz
              0.5% (stereo), 0.3% (mono)
Separation   35 dB at 1 kHz
Frequency response   30 – 15,000 Hz
Capture ratio   2 dB

AM

Tuning range   530 – 1,710 kHz
Antenna terminal   External antenna connector
Intermediate frequency
              10.71 MHz/450 kHz
Sensitivity   30 μV

Power amplifier section

Outputs   Speaker outputs
              (sure seal connectors)
Speaker impedance   4 – 8 ohms
Maximum power output
              20 W × 4 (at 4 ohms)

General

Output lead   Power antenna relay control lead
              Power amplifier control lead
Tone controls   Bass ± 8 dB at 100 Hz
              Treble ± 8 dB at 10 kHz
Loudness   +6 dB at 100 Hz
              +6 dB at 10 kHz
Power requirements   12 V DC car battery (negative ground)
Dimensions   Approx. 178 × 50 × 160 mm
              ($7^1/_8 \times 2 \times 6^3/_8$ inches) (w/h/d), not incl. projecting parts and controls
Mounting dimensions   Approx. 178 × 50 × 145 mm
              ($7^1/_8 \times 2 \times 5^7/_8$ inches) (w/h/d), not incl. projecting parts and controls
Mass   Approx. 1.3 kg (2 lb. 14 oz.)
Accessories supplied   Mounting hardware (1 set)
              Power connecting cord (1)
              Front panel case (1)

U.S. and foreign patents licensed from Dolby Laboratories Licensing Corporation.

FM/AM MINIDISC PLAYER

SONY®

TABLE OF CONTENTS

Connection / Connexions

Connection / Connexions

Caution

- This unit is designed for negative ground 12 V DC operation only.
- Before making connections, disconnect the ground terminal of the car battery to avoid short circuits.
- Connect the yellow and red power input leads only after all other leads have been connected.
- Be sure to connect the red power input lead to the positive 12 V power terminal which is energized when the ignition key is in the accessory position.
- Run all ground wires to a common ground point.

When the Unit is Used in a Car with No Accessory Position on the Ignition Key Switch
— POWER SELECT Switch

The illumination on the front panel is factory-set to be turned on even when the unit is not being played. However, this setting may cause some car battery wear if the unit is used in a car with no accessory position on the ignition key switch.
To avoid this battery wear when using the unit in such a car, set the POWER SELECT switch located on the bottom of the unit to the OFF position. The illumination is reset to stay off when the unit is not being played.

Note
The caution alarm for the front panel is not activated when the POWER SELECT switch is set to the OFF position.

When a digital pre-amplifier etc. is connected
— LINE-OUT/LINE-IN (EQ-IN) Switch

Set the LINE-OUT/LINE-IN (EQ-IN) switch, which is on the underside of the unit, to position LINE-IN, so that the LINE-OUT/LINE-IN (EQ-IN) terminal will function as LINE-IN (EQ-IN) terminal. When the switch is set to LINE-OUT, the terminal will work as LINE-OUT terminal.

Change the position with a jeweler's screwdriver or similar tool.
Changez la position avec un tournevis de joaillier ou un objet similaire.

When you change the position of the switch, be sure to press one of the reset buttons after the connections are completed.

Précautions

- Cet appareil est conçu pour fonctionner sur courant continu de 12 V avec masse négative.
- Avant d'effectuer les raccordements, débranchez la borne de terre de la batterie du véhicule pour éviter tout court-circuit.
- Raccordez les fils jaune et rouge d'alimentation uniquement après avoir réalisé toutes les autres connexions.
- Raccordez le fil d'alimentation rouge à la borne positive de 12 V qui est alimentée quand la clé de contact est sur la position accessoire.
- Rassemblez tous les fils de terre en un point de masse commun.

Si l'appareil est utilisé dans une voiture dont l'interruptew d'allumage n'a pas de position accessoire
— Interrupteur POWER SELECT

L'éclairage e du panneau avant est réglé en usine de manière à s'allumer même quand l'appareil ne fonctionne pas. Cependant, ce réglage risque d'épuiser la batterie si l'appareil est utilisé dans une voiture dont l'interruptew d'allumage ne possède pas de position accessoire. Pour éviter cet inconvénient, réglez l'interrupteur POWER SELECT sous l'appareil sur OFF. L'éclairage rester éteint quand l'appareil n'est pas utilisé.

Remarque
Quand l'interrupteur POWER SELECT est réglé sur OFF, l'avertisseur du panneau avant ne fonctionne pas.

Quand un préamplificateur numérique, entre autres, est raccordé
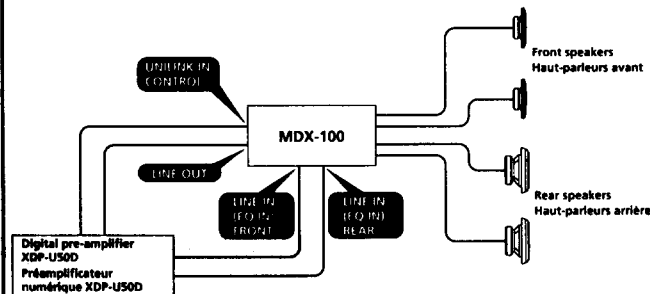— Sélecteur LINE-OUT/LINE-IN

Réglez le sélecteur LINE-OUT/LINE-IN (EQ-IN), qui se trouve sous l'appareil, sur la position LINE-IN, pour que la borne LINE-OUT/LINE-IN (EQ-IN) fonctionne comme borne LINE-IN (EQ-IN). Quand le sélecteur est sur LINE-OUT, la borne fonctionne comme borne LINE-OUT.

Si vous changez la position de l'interrupteur, n'oubliez pas d'appuyer sur une des touches de réinitialisation après avoir terminé tous les raccordements.

Connection Diagram / Schémas de raccordement

Example 1 Set the LINE-OUT/LINE-IN (EQ-IN) switch to position LINE-IN (EQ-IN)
Exemple 1 Réglez le sélecteur LINE-OUT/LINE-IN (EQ-IN) sur la position LINE-IN (EQ-IN)

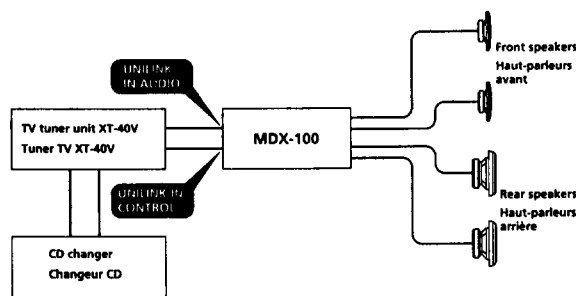**Example 2** Set the LINE-OUT/LINE-IN (EQ-IN) switch to position LINE-OUT.
Exemple 2 Réglez le sélecteur LINE-OUT/LINE-IN (EQ-IN) sur la position LINE-OUT.
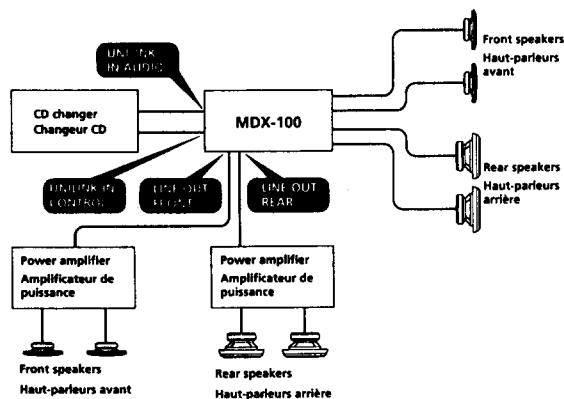
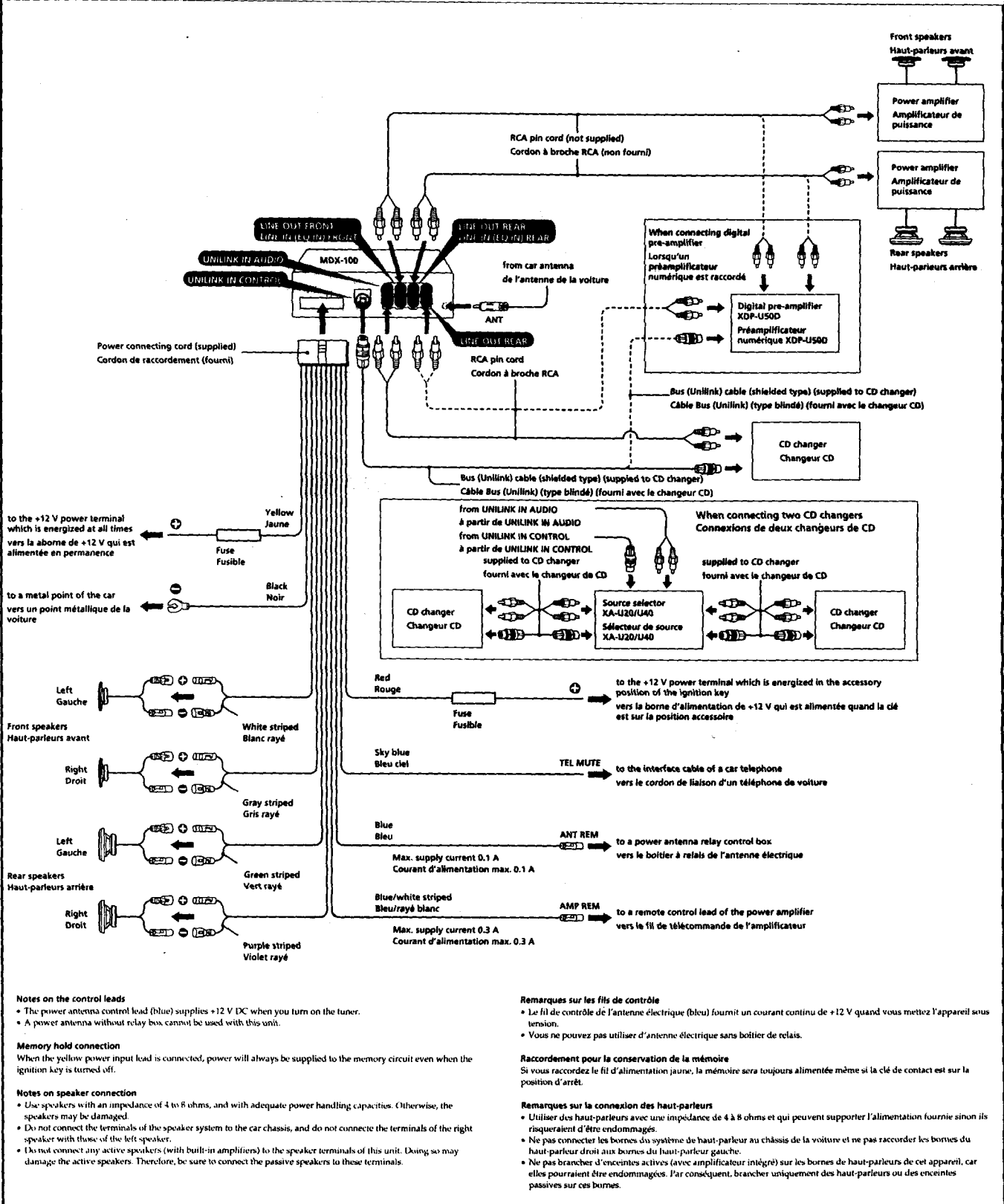

If you connect two or more CD changers, the source selector XA-U20 or XA-U40 is required.
Vous devrez utiliser le sélecteur de source XA-U20 ou XA-U40, si vous raccordez au moins deux changeurs.

Example 3 Set the LINE-OUT/LINE-IN (EQ-IN) switch to position LINE-OUT
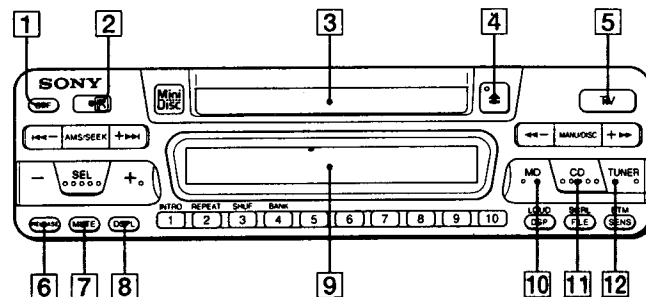**Exemple 3** Réglez le sélecteur LINE-OUT/LINE-IN (EQ-IN) sur la position LINE-OUT

Notes on the control leads
- The power antenna control lead (blue) supplies +12 V DC when you turn on the tuner.
- A power antenna without relay box cannot be used with this unit.

Memory hold connection
When the yellow power input lead is connected, power will always be supplied to the memory circuit even when the ignition key is turned off.

Notes on speaker connection
- Use speakers with an impedance of 4 to 8 ohms, and with adequate power handling capacities. Otherwise, the speakers may be damaged.
- Do not connect the terminals of the speaker system to the car chassis, and do not connect the terminals of the right speaker with those of the left speaker.
- Do not connect any active speakers (with built-in amplifiers) to the speaker terminals of this unit. Doing so may damage the active speakers. Therefore, be sure to connect the passive speakers to these terminals.

Remarques sur les fils de contrôle
- Le fil de contrôle de l'antenne électrique (bleu) fournit un courant continu de +12 V quand vous mettez l'appareil sous tension.
- Vous ne pouvez pas utiliser d'antenne électrique sans boîtier de relais.

Raccordement pour la conservation de la mémoire
Si vous raccordez le fil d'alimentation jaune, la mémoire sera toujours alimentée même si la clé de contact est sur la position d'arrêt.

Remarques sur la connexion des haut-parleurs
- Utiliser des haut-parleurs avec une impédance de 4 à 8 ohms et qui peuvent supporter l'alimentation fournie sinon ils risqueraient d'être endommagés.
- Ne pas connecter les bornes du système de haut-parleur au châssis de la voiture et ne pas raccorder les bornes du haut-parleur droit aux bornes du haut-parleur gauche.
- Ne pas brancher d'enceintes actives (avec amplificateur intégré) sur les bornes de haut-parleurs de cet appareil, car elles pourraient être endommagées. Par conséquent, brancher uniquement des haut-parleurs ou des enceintes passives sur ces bornes.

—4—

Location and Function of Controls

Main unit

Refer to the pages in ● for details.

1 OFF button
Press to turn off the unit.

2 Receptor (for the optional wireless remote commander)

3 MiniDisc compartment

4 ▲ (eject) button ●

5 TV (television/video select) button*[1]
Each time the button is pressed, the mode changes in order of:
TV (television picture) → VIDEO 1 (video picture) → VIDEO 2*[2] → TV.
*[1] Only when the optional TV tuner unit is connected.
*[2] Only when the rear TV monitor is connected and the "VIDEO 2" mode is selected.

6 RELEASE (front panel release) button ●

7 MUTE button
Press to mute the sound momentarily.
Press again to restore the same volume level.
This button is also canceled in the following cases:
— when the + side of the ⌐_/+⌐ button or the OFF button is pressed.
— when ejecting a MiniDisc by pressing the ▲ button during MiniDisc playback.
— when the ignition key of your car has been turned to the OFF position for more than eight seconds.

8 DSPL (display mode change/time set) button
Each time the button is pressed, the display on the display window changes as follows:

MiniDisc	Elapsed playback time → Disc title* → Track title → Clock
CD	Elapsed playback time → Disc title* → Clock
Radio	Station name* → Frequency → Clock
TV	Channel number → TV station* → Clock

* If the title has not being registered, "NO Name" indication will appear on the display window.

9 Display window

10 MD (MiniDisc play) button ●

11 CD (disc play/CD changer select) button ●

12 TUNER (radio on/band select) button
Each time the button is pressed, the band changes in order of:
FM1 → FM2 → AM → FM1
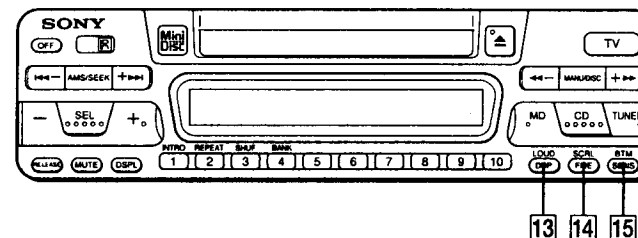
13 DSP (Digital Signal Processor mode on • off/select)/LOUD (loudness) button
If pressed lightly with the DSP XDP-U50D connected, this button will function as the DSP mode on/off button. If you press for more than one second, the unit will enter the DSP select/adjust mode. Each time you press the button, the DSP select/adjust mode and the display on the display window will change as follows:

| Display window	DSP select/adjust mode
SUR	Surround menu select/ Effect level adjust
LP 1	Listening position adjustment
SUB	Subwoofer tone/volume adjustment
BAS	Bass adjustment
TRE	Treble adjustment

Loudness mode
If pressed with the DSP XDP-U50D not connected, this button will serve to reinforce bass and treble at low volume. To cancel the loudness mode, press the button again.

14 FILE (custom file mode select • set/list up)/SCRL (scroll) button
Each time the button is pressed, the mode changes as follows:
→ : Press the button for more than two seconds.
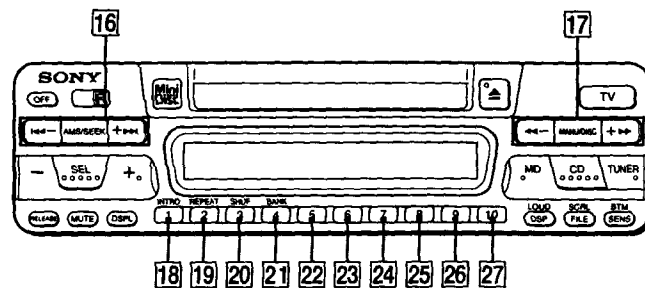–→ : Press the button lightly.
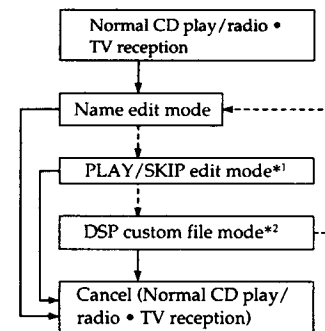
*[1] The unit enters this mode only when the CD custom file function is activated.
*[2] The unit enters this mode only when the DSP custom file function is activated.

If the button is pressed only lightly while the optional TV tuner and monitor are connected, the information of the disc and radio/TV will be displayed on the TV monitor.

15 SENS (sensitivity adjust)/BTM (Best Tuning Memory) button ● ●

|	During MiniDisc/CD play	Radio/TV reception
[16]	**AMS (Automatic Music Sensor) button** [+►►] : Press once to locate the beginning of the next track. [►◄−] : Press once to locate the beginning of the currently playing or a previous track. During playback, press only as many times as the number of tracks you want to skip. (Include also the current track in this number when locating a previous track.) **Note** When you keep the AMS button pressed and reach either the beginning or end of a MiniDisc, you will not be able to go any further.	**SEEK (automatic tuning) button ⑯** Press either side of the button.
[17]	**MANU (manual search) button** Keep either side of the button pressed until the desired part of a track is located. [+►►] : To fast-forward [►◄−] : To fast-reverse **Note** If you keep the DISC button pressed and reach the end of the MiniDisc, "Lead Out" will appear on the display window. Likewise, if the beginning of the MiniDisc has been reached, "Lead In" will appear on the display window. **DISC (disc change) button** Press the button lightly to select discs. (When the optional Sony CD changer(s) are connected) [+►►] : To select the next disc number [►◄−] : To select the previous disc number	**MANU (manual tuning) button ⑰** Keep the MANU button pressed.

	During MiniDisc/CD play	Radio/TV reception
[18]	**INTRO (intro scan) button ⑱ ㊽**	
[19]	**REPEAT (repeat play) button ⑲ ㊼**	
[20]	**SHUF (shuffle play) button ⑳ ㊻**	
[21]	**BANK button (during CD play) ㊾**	
[22]	—	Preset number buttons
[23]	—.	㊿
[24]	—	
[25]	—	
[26]	—	
[27]	—	

The buttons ⑱-⑰ also function as the direct disc selection buttons during CD play. Press the button whose number corresponds with the desired disc number for more than one second.

8

9
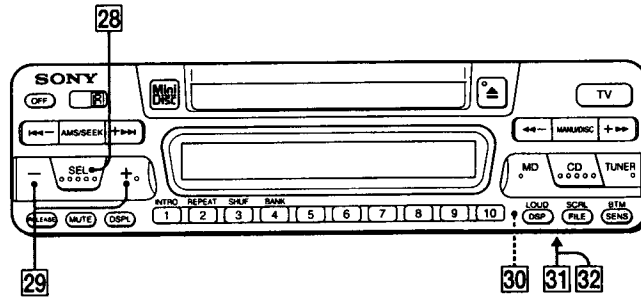
28 SEL (control mode select/character set) button

29 ⌐_/+⌐ (bass/treble/balance/fader/volume control/character select) button

Normally, either side of the ⌐_/+⌐ button is pressed to control the volume. Pressing the SEL button changes the mode as follows:

→BAS (bass) → TRE (treble) → BAL (balance) → FAD (fader) → VOL (volume) ─

Press either side of the ⌐_/+⌐ button (to adjust the level) within three seconds, or the volume mode will return.

Display window	SEL	⌐_/+⌐	
	Control mode	Press – side	Press + side
BAS	Bass control	For less bass	For more bass
TRE	Treble control	For less treble	For more treble
BAL	Balance control	To decrease the right speaker's volume	To decrease the left speaker's volume
FAD	Fader control*	To decrease the rear speaker's volume	To decrease the front speaker's volume
VOL	Volume control	For less volume	For more volume

* When the optional XDP-U50D is connected, the fader settings can be set separately for the DSP on mode and DSP off mode.
When you use a stereo graphic equalizer (not supplied), set the fader control to the center position and adjust the level with the equalizer.

30 Reset button (located on the front side of the unit hidden by the front panel)
Press this button when you use this unit for the first time, when you have changed the car battery, or when the buttons of this unit do not function properly.

31 POWER SELECT switch (located on the bottom of the unit)
See "POWER SELECT Switch" in the Installation/Connections manual.

32 LINE-OUT/LINE-IN (EQ-IN) switch (located on the bottom of the unit)
See "LINE-OUT/LINE-IN switch" in the Installation/Connections manual.

When the positions of switches **31** to **32** have been changed, be sure to press the RESET button after connecting power.

Changing the illumination color

Press the INTRO ⌐⌐ button while pressing the SEL button. You can choose the color between amber and green.

Muting the beep tone

Press the ⌐6⌐ button while pressing the SEL button. To obtain the beep tone again, press these buttons once more.

SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

MD BLOCK

❶ +PTT2.6 × 6 (S)

❷ cover

❺ +PTT2.6 × 4 (S)

❼ MD block

❺ Sub panel

chassis assy

❸ +B2 × 4

❻ +PTT2.6 × 4 (S)

❹ +PTT2.6 × 8 (S)

FLOAT BLOCK ASSY

⑱ loder (L) ass'y

⑨ +P2 × 2.2

⑪ +P2 × 2.2

⑫ +P2 × 2.2

⑩ lever (SW)

⑪ loder (R) ass'y

① +P2 × 2.2

② spring (LL)

③ lever (LL)

㉑ float block ass'y

⑳ damper ass'y

⑯ P2 × 2.2

⑰ P2 × 2.2

⑥ reel stoper

⑦ reel stoper

⑲ bracet (rear)

chassis (L) ass'y

⑮ P2 × 2.2

⑤ gear

④ washer

⑧ lever (X) ass'y

MD chassis ass'y

⑬ P2 × 2.2

CHASSIS (OP) BLOCK ASSY

① +P1.7 × 3

⑨ holder ass'y

⑥ poly-washer

⑦ reel table thrust retainer

⑧ chassis (R) ass'y

③ spring (CHR)

② +P1.7 × 3

⑤ spring (CHL)

⑩ chassis (OP) ass'y

④ +P1.7 × 3

SECTION 3
DIAGRAMS

3-1. IC PORT FUNCTION DESCRIPTION
MASTER MICRO COMPUTER μPD75518GF-160-3B9 (MAIN BOARD IC501)

Pin No.	Port Name	I/O	Description
1	KI0	ADI	Key input by A/D conversion no.0

AD VALUE [V]	KEY-IN0 AN0	With SEL /+
0 − 0.293	EJECT	
0.313 − 0.605	TV	
0.625 − 0.918	DSP/LOUD	DSP FILE
0.938 − 1.230	10	
1.250 − 1.543	9	
1.563 − 1.855	8	LINE OUT LEVEL
1.875 − 2.168	7	
2.188 − 2.480	6	
2.500 − 2.793	5	
2.813 − 3.105	4 BANK	BANK INV
3.125 − 3.418	3 SHUF	
3.438 − 3.730	2 REPEAT	
3.750 − 4.403	1 INTRO	BEEP
4.063 − 4.355	DSPL	ILLUMINATION
4.375 − 4.668	(KEY OFF)	

Pin No.	Port Name	I/O	Description
2	AV$_{DD}$	−	Reference voltage input for A/D converter input (5 V).
3	V$_{DD}$	−	Power for μ-COM
4	V$_{DD}$	−	Power for μ-COM
5	KEY-ACT	O	Power on/off switch for A/D buttons. High: POWER ON, Low: POWER OFF
6	AMP-ON	O	LED on/off switch for general keys on nose. High: LED on, Low: LED off.
7	ILL-ON	O	LED on/off switch for source keys on nose. High: LED on, Low: LED off.
8	COLOR	O	LED color select High: GREEN, Low: AMBER
9	MUTE	O	Head unit internal mute High: On source selection or during stop, Low: During playback.
10	AUX-MUTE	O	UNI-LINK slave unit mute High: During internal slave playback or stop. Low: During playback. Not used Open.
11	AMP-MUTE	O	Mute for internal power amplifier out.
12		O	Not used Open.
13	ANT. REM	O	Output for power antenna. It is high in tuner and TV modes. High: FM, AM, MW, LW, TV modes, Low: Other modes.
14	MD-P-ON	O	Power supply control for Preamp section and MD board. Alway high when ACC is high
15	MD2-ON	O	Wake up/sleep control for MECHA μ-COM. High: MECHA μ-COM ACTIVE, Low: MECHA μ-COM SLEEP
16	MD-RESET	O	Reset for MECHA μ-COM. Reset MECHA μ-COM at ⌐⌐.
17	MD-DATA. IN	I	Communication data input from MECHA μ-COM.
18	MD-DATA. OUT	O	Communication data output to MECHA μ-COM.
19	MD-CLK	O	CLOCK of the communication between MASTER μ-COM and MECHA μ-COM out.
20	MD-CS	O	MASTER μ-COM transfer request on the communication between MASTER μ-COM and MECHA μ-COM. Request at ⌐.
21	VOL-CE	O	Chip enable to electronic volume
22	VOL-INT	O	Initializing signal for electronic volume . High except initializing
23	VOL-CLK	O	Clock to electronic volume
24	VOL-DATA	O	Data to electronic volume

Pin No.	Port Name	I/O	Description
25		O	Not used Open
26		O	Not used Open
27		O	Not used Open
28		O	Not used Open
29		I	Not used Open
30		I	Not used GND
31		I	Not used GND
32		I	Not used GND
33	Vss	—	Ground for μ-COM
34		I	Not used GND
35		I	Not used GND
36		I	Not used GND
37		I	Not used GND
38		O	Not used Open.
39		O	Not used Open.
40		O	Not used Open.
41		O	Not used Open.
42	$\overline{\text{SYSTEM-RESET}}$	O	System reset for UNI-LINK
43	$\overline{\text{BUS ON}}$	O	Controls UNI-LINK bus activation High: BUS SLEEP, Low: BUS ACTIVE
44	CLK OUT	O	Clock out for UNI-LINK
45	BEEP	O	Beep out. When requesting beep out, rectangular wave is out.
46	$\overline{\text{ACC-CHECK}}$	I	ACC SW in High: ACC OFF, Low: ACC ON
47	KEY-ACK	I	Rises low to high by pushing KEY IN 0 or KEY IN 1 when KEY-ACTIVE is low. Usually high level is out when KEY-ACTIVE is high.
48	C-SW	I	Mechanism deck cartridge in switch High: There is a cartridge, Low: There is not.
49	SIRCS-IN	I	SIRCS input from remote controller
50	DATA IN	I	Data input from UNI-LINK
51	DATA OUT	O	Data output to UNI-LINK
52	CLK IN	I	Clock output to UNI-LINK. Input from pin ㊹.
53	B/U-CHECK	I	For back-up check High: BACK UP ON, Low: BACK UP OFF
54	Vss	—	Ground for μ-COM
55	XT1	—	Sub system clock
56	XT2	—	Sub system clock
57	GND	—	Connected to internally connected Vss.
58	X1	—	Main system clock
59	X2	—	Main system clock
60	$\overline{\text{RESET IN}}$	I	Reset for μ-COM

Pin No.	Port Name	I/O	Description
61	LCD-C/O	O	Command/data select Low: Data, High: Command
62	LCD-CE	O	Chip enable to LCD driver
63	LCD-CLK	O	Clock to LCD driver
64	LCD-DATA	O	Data to LCD driver
65	GFS	I	GFS monitor input for test mode. High: GFS OK
66	TEL-MUTE	I	Telephone mute input. Attenuate audio output − 20 dB by putting low level in.
67	MD-SRQ	I	MECHA μ-COM transfer request on the communication between MASTER μ-COM and MECHA μ-COM. Request at ⌐ .
68	N-SW	I	Input there is nose or not. High: There is a nose, Low: There is not.
69		O	Not used Open.
70	SEL-A/D	O	ANALOG AUDIO/DIGITAL AUDIO SOURCE select High: DIGITAL, Low: ANALOG . Not used. Open
71		O	Not used. Open
72	KEY-ACT	O	A/D conversion button, reference Power supply on/off output Low: On, High: off.
73	GND		Ground for A/D converter input
74		ADI	Not used GND
75	P-SEL. SW	ADI	Power select switch input High: POWER SEL ON, Low: POWER SEL OFF
76	EQ-ON	ADI	EQ on /off. control
77	DEST-SEL	ADI	There is TV key/on not. Low : There is TV key High : None
78		ADI	Not used, GND
79		ADI	Not used, GND
80	KEY-IN1	ADI	Key input by A/D conversion no. 1

AD VALUE [V]	KEY-IN1 AN1
0 − 0.293	OFF
0.313 − 0.605	MD
0.625 − 0.918	FM/AM
0.938 − 1.230	CD
1.250 − 1.543	MANU/DISC −
1.563 − 1.855	MANU/DISC+
1.875 − 2.168	SENS/BTM
2.188 − 2.480	FILE/SCROL
2.500 − 2.793	MUTE
2.813 − 3.105	VOL −
3.125 − 3.418	SEL
3.438 − 3.730	VOL+
3.750 − 4.403	SEEK/AMS −
4.063 − 4.355	SEEK/AMS+
4.375 − 4.668	(KEY OFF)

SYSTEM CONTROL MN1882417SZP (MAIN BOARD IC502)

Pin No.	Port Name	I/O	Description
1 - 6	————	——	Not used. Open
7	V$_{DD}$	——	Power supply in
8	OSC1	——	Connected to oscillator
9	OSC2	——	8 MHz
10	V$_{SS}$	——	GND
11	X1	——	Not used. Open
12	X0	——	Not used. Open
13	EX2	——	GND
14	$\overline{\text{RESET}}$	——	Reset in
15	RDS-CLK	——	Not used. Open
16	BU-CHECK	I	Detects back-up
17	BUS-ON	I	Bus interface bus on signal in. *1
18 - 29	————	——	Not used. Open
30	RDS-DATA	O	Not used. Open
31	GND	I	GND
32	AM-ST	I/O	Not used. Open
33	————	——	Not used. Open
34	————	——	Not used. Open
35	————	——	Not used. Open
36	GND	I	GND
37	GND	I	GND
38	DI	I	PLL data input
39	DO	O	PLL data output
40	CLK	O	PLL CLK output
41	CE	O	PLL CE output
42	REQUEST	O	Bus interface request (High: Requests communication)
43	LINK-OFF	O	Bus interface INT-LINK *2
44	SCK	I	Bus interface clk input
45	SI	I	Bus interface data input
46	SO	O	Bus interface data output
47	V$_{DD}$	——	Power supply
48	AV$_{DD}$	——	Power supply for AD input port
49	VREF	——	Reference voltage for AD port in (side +)
50	————	——	GND
51	————	——	GND
52	RAM-RST	I	RAM reset input *3
53	MUTE-SEL	I	Mute operation select (Refer to pin ⑯)
54	MS-1	I	Mode select input (Reads out on reset)
55	MS-2	I	
56	AM-ST	I	AM/FM signal meter voltage detects *4
57	FM-ST	I	
58	GND	——	GND
59	————	——	GND
60	————	——	GND

Pin No.	Port Name	I/O	Description
61	TU-ON	O	TUNER-ON out. Not used
62	DX/LO	O	DX/LOCAL out. Not used
63	SEEK	O	SEEK-out *5
64	AM-ON	O	AM-ON out High: AM
65	FM-ON	O	FM-ON out Low: FM
66	MUTE	O	MUTE out *6
67	AF-SEEK	O	AUDIO source select
68	SIGNAL1	O	
69	———	——	Not used
70	FM-ST	I/O	Used both as ST indicating signal input and force-mono output Stereo indicator turns on when low level input. Low level output when force-mono output.
71	SD-IN	I	SD signal input (Decides the level for stopping SEEK, AUTO-MEMORY, SCAN or the like)
72 – 80	———	——	Not used

*1. Interrupting terminal for bus on/off detection .

*2. High : Link-off.
Low : Bus is connecting.

*3. For checking SRAM data is not broken by a voltage reduction.

*4. Mode select.

*5. Generates low level to change the frequency.

*6. Operation is different according to pin ⑤④ (MUTE-SEL)

MS-1	MS-2	Destination
L	L	J (AM
H	L	J (AM MONO)
L	H	US
H	H	AEP

	TUNER PLAYNG	TUNER BEHIND	TUNER OFF	ACC OFF	POWER OFF	BACK UP OFF	BUS OFF
⑤④(MUTE – SEL): High	Normal operation	Alway low	L	L	L	Input	Input
⑤④(MUTE – SEL):Low	Normal operation	Always high	H	H	H	Input	Input

MECHA MICRO COMPUTER μPD78136GF-034-3B9 (MD SERVO BOARD IC514)

Pin No.	Port Name	I/O	Description
1	TEST ON	I	TEST on/off. High: ON, Low: OFF.
2	SI	I	Communication data input from MASTER μ − COM.
3	SO	O	Communication data output to MASTER μ − COM.
4	SCK	I	CLOCK of the communication between MASTER μ-COM and MECHA μ-COM in.
5	WP	INT	nomally 5V.
6	DQSY	INT	DQ S/NC interruption. Interrupted at ⌐L.
7	SQSY	INT	SUBQ SYNC interruption. Interrupted at ⌐L.
8	ATSY	INT	ADIP SYNC interruption. Interrupted at ⌐L.
9	DEFECT	I	Not used Open.
10	FOK	I	Focus OK. High: FOK.
11	CS	INT	Not used.
12	CS	I	Chip select signal for the communication between. Master μ-COM and MECHA μ-COM in
13	5V POWER	O	Servo IC power control. High: POWER ON, Low: POWER OFF
14	SRQ	O	MECHA μ-COM transfer request on the communication between MASTER μ-COM and MECHA μ-COM. Request at ⌐L.
15	LOAD	O	LOADING/EJECT output for motor
16	EJECT	O	LOADING/EJECT output for motor
17	LDON	O	Laser on/off output High: LASER OFF, Low: LASER ON
18	LDPOWER	O	Laser power control Low: On low reflecting rate disc (MO), High: On high reflecting rate disc (CD).
19	AVss		Ground for A/D convertor input. (0 V)
20	AV REF		Reference voltage input for A/D convertor. (5 V)
21	SW1	ADI	Loading start switch, eject end switch. Loading starts on _⌐ , Eject is end on ⌐L.
22	SW2	ADI	Loading end switch Loading is end on ⌐L.
23	SW3	ADI	(Not used) Open.
24	SW4	ADI	Disc reflecting rate detection switch. Detects from holes on the cartridge. Low: On high reflecting rate disc (CD), High: On low reflecting rate disc (MO).
25	TEMP	ADI	Detects the mechanism deck is high temperature or not. High: normal, Low: high temperature
26	TEST	ADI	Not used Open.
27	TEST	ADI	Not used Open.
28	TEST	ADI	Not used Open.
29	RESET		Reset for μ-COM. Low: Reset
30	VDD		Power for μ-COM
31	X2		For the system clock. 12MHz
32	X1		For the system clock. 12MHz
33	Vss		Ground for μ-COM
34	RFSW1	O	Disc mode High: On pit, Low: On groove

For pins 15/16 (LOAD/EJECT output for motor):

	LOAD	EJECT	STOP	BRAKE
LOAD	High	Low	Low	High
EJECT	Low	High	Low	High

Pin No.	Port Name	I/O	Description
35	RFSW0	O	Disc mode High: On CD, Low: On MO
36	ASYSW	O	On playing back CD disc pit: Fixed to high. On playing back MO disc groove: High=Normal, Low=On track jump operation.
37	AGCSW	O	AGC time constant select High: Focusing starts, Low: Focusing is end.
38	MIRRSW	O	On playing back CD disc pit: Fixed to low. On playing back MO disc groove: High=Normal, Low=On track jump operation and on the time from CLV, tracking, sled servo go on to starting is OK.
39	DFCTSW	O	High: Focusing starts. Low: All servo (Focus, CLV, Tracking, sled) is on.
40	SLO MUTE	O	Motor driver power control "High": ON, "Low": OFF
41	COMP		Not used Open.
42 ~ 49	TEST	I	KEY SCAN input 0 to test pin
50	FOK	I	Focus OK High: Focus OK, Low: Focus NG
51	ATT	O	CXD2527 Attenuation (− 12dB) High: On, Low: Off
52	AEXEC	O	CXD2527 start High: Start, Low: Stop
53	CD/MO	I	Connected to CXA1381. CD/MO (reflecting rate) discrimination High: High reflection, Low: Low reflection
54	SENS	I	SENSE input from CXA1082 and CXD2525. (Internal status)
55	LOCK	I	LOCK input from CXD2525. "High": CLV lock, "Low": CLV unlock
56	GD FS	I	GFS (Guard frame sink) OK High: GFS OK, Low: GFS NG
57	XINT	I	CXD2526 interruption. Detects ⌐_ low level.
58	MD2	O	Digital out on/off (High: on)
59	DIRC	O	High: Detects track jump TZC, Low: 1 track jump end
60	XRST	O	Reset the servo IC on ⌐_Γ.
61	SORS	O	Reset ENSCOR
62	SBMN	O	Connected to CXD2526 SBMN. "High": Sub data control, "Low": Main data control
63	WRMN	O	Writing enable signal output to RAM (High:playback mode, Low: Monitor mode)
64	RCPB	O	REC/PB selection High: REC, Low: PB. Not used. Open.
65	SCTX	O	CD-DA mode SCOR input
66	FOST SW	O	Focus error offset select.
67	Vss	−	Ground for μ-COM
68	EA	−	Not used. Pull up.
69	SCK	I	Clock for serial communication to servo IC.
70	ARST	O	Reset output to CXD2527. Reset on ⌐_Γ.
71	SWDT	O	Write data for serial communication to servo IC.
72	SRDT	O	Read data for serial communication to servo IC.
73	XLAT	O	Latch for serial communication to servo IC.
74	MDT	O	Digital filter interface clock out.
75	MCK	O	Digital filter interface data out.
76	MLEN	O	Digital filter interface latch enable out.
77	VDD	−	Power for μ-COM
78	8VPOWER	−	8 V system power supply. High: On, Low: Off
79	MUTE	O	Audio mute High: Mute on, Low: Mute off
80		−	Not used, Open.

● IC Block Diagrams

IC2 LC7216M-TP-T1 (MAIN BOARD)
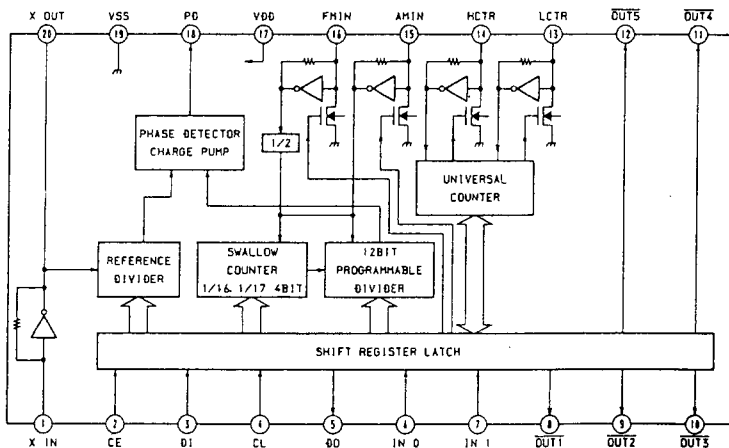
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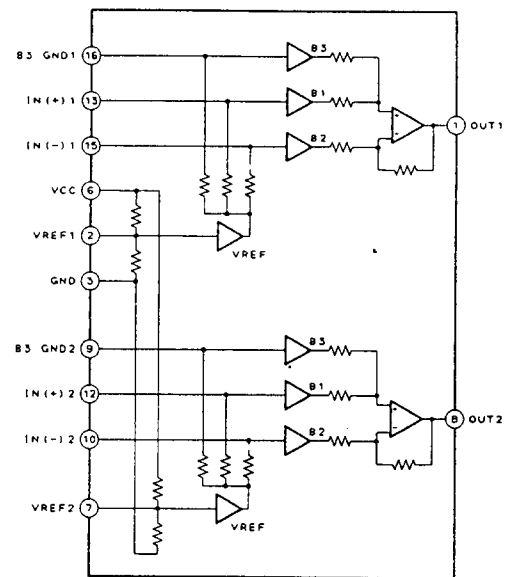
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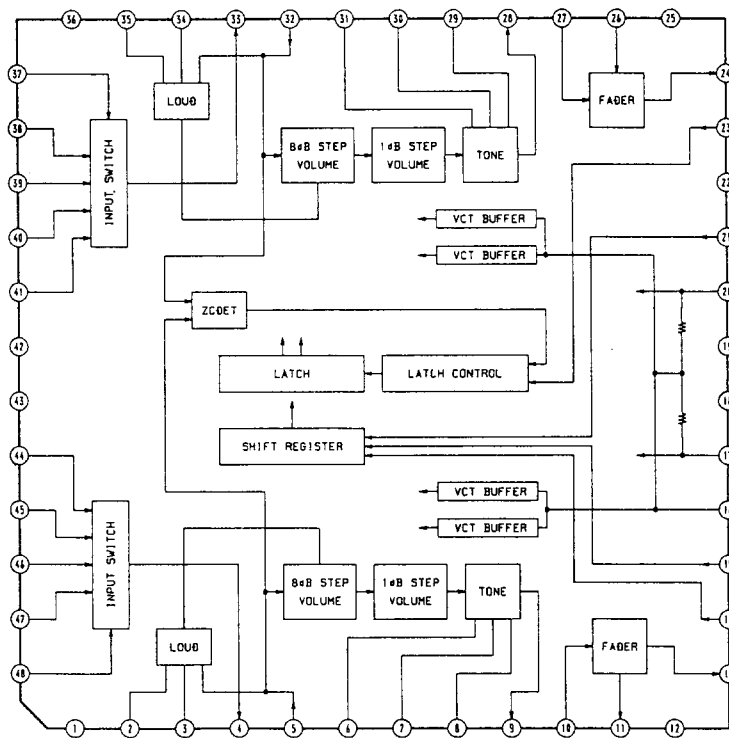
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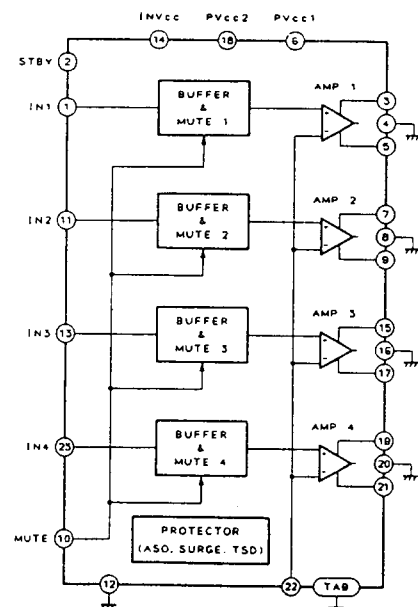
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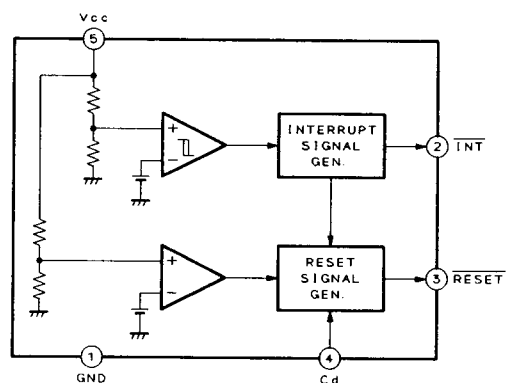
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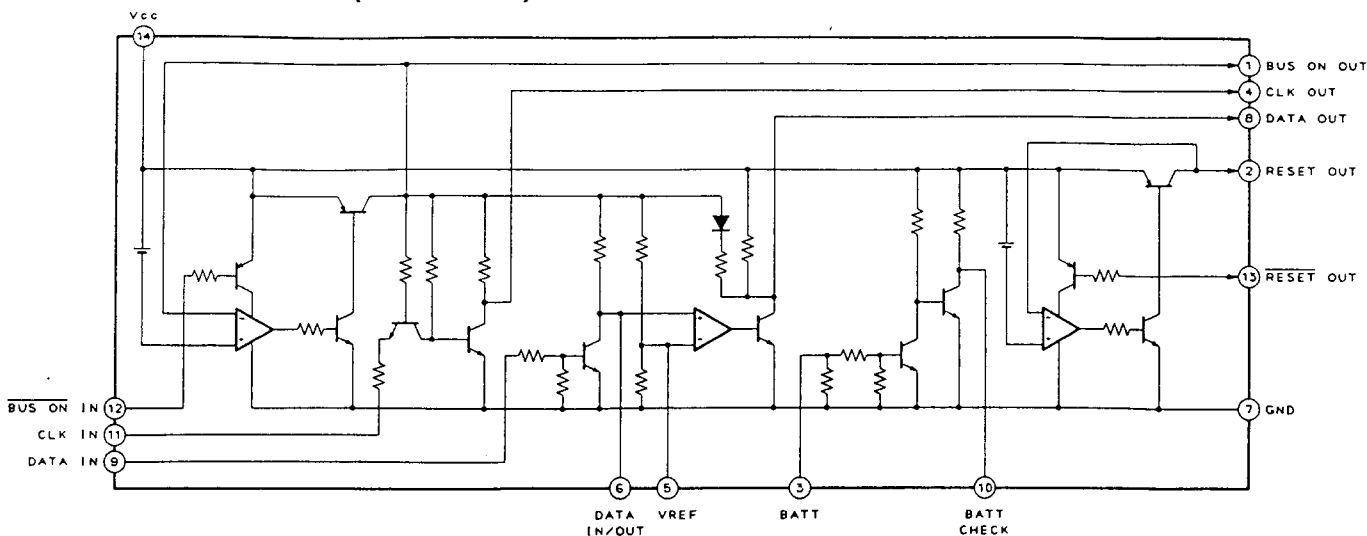
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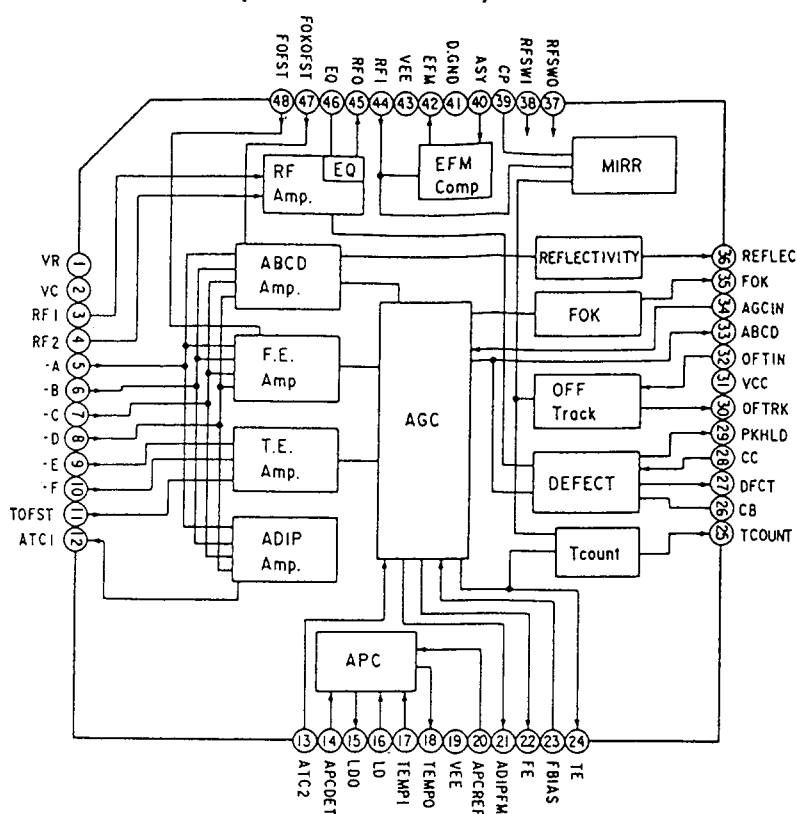
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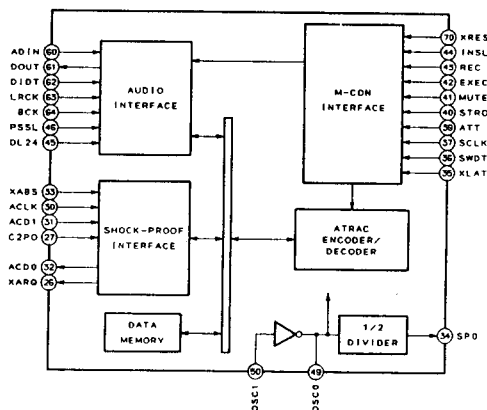
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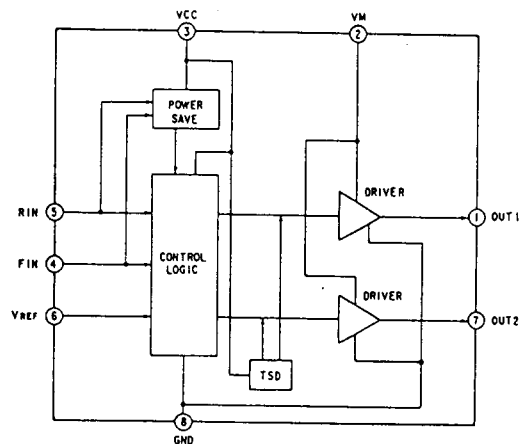
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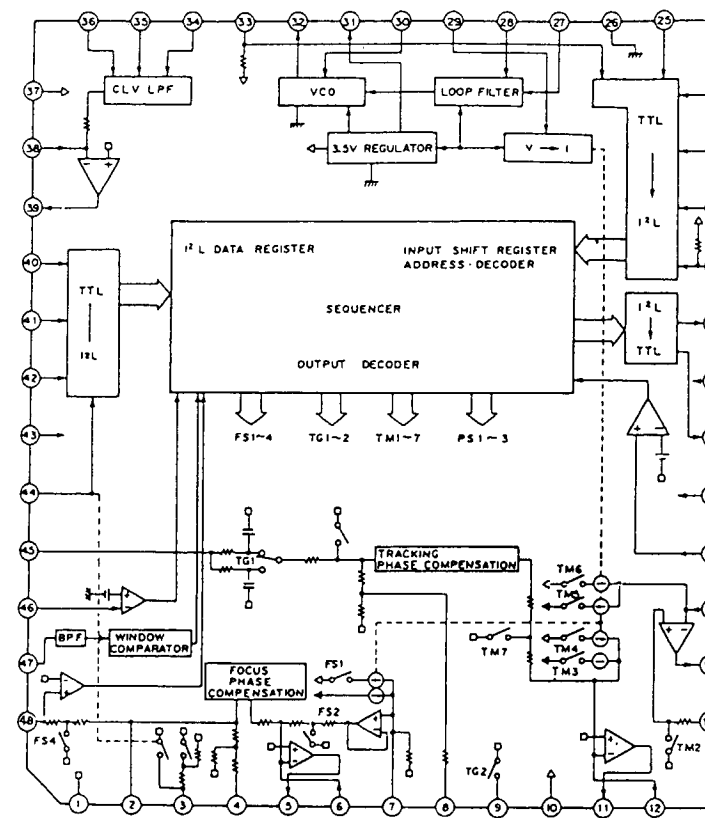
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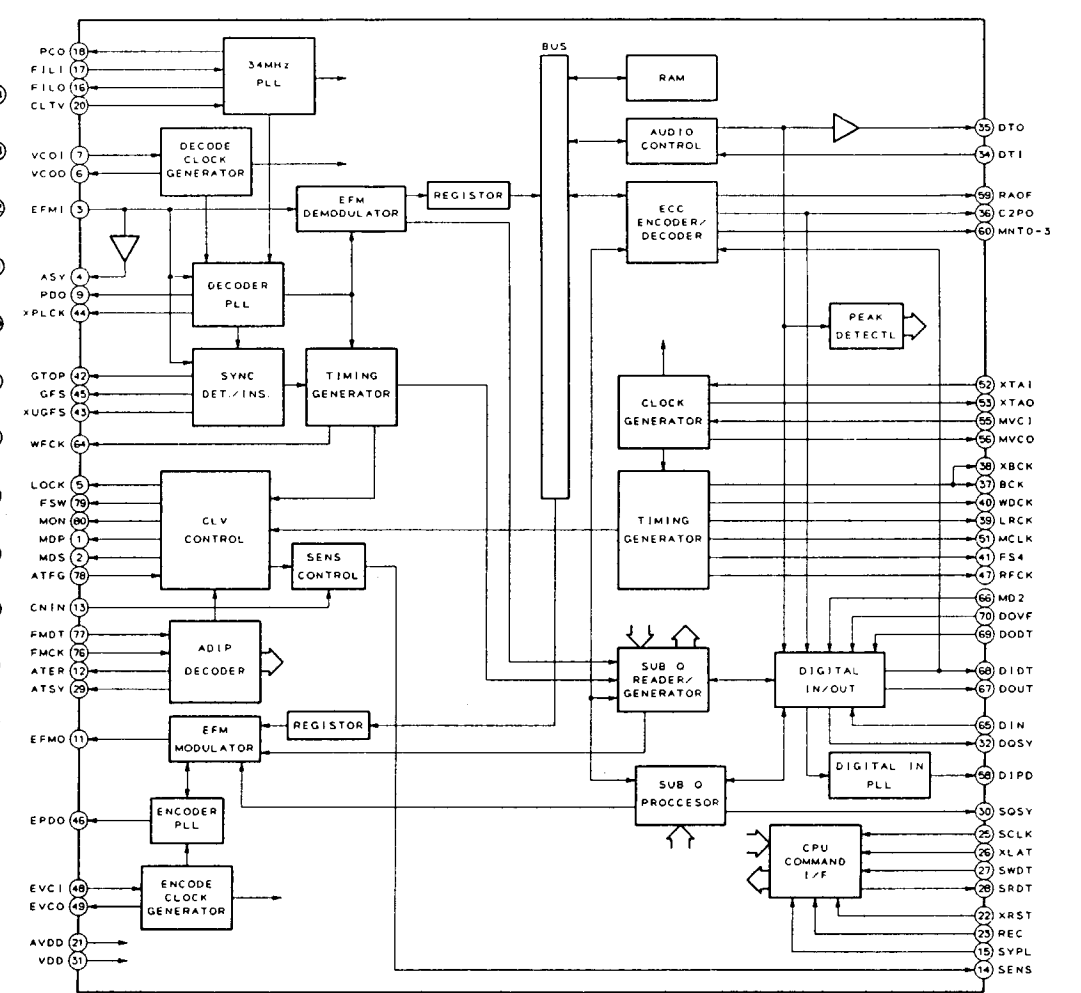
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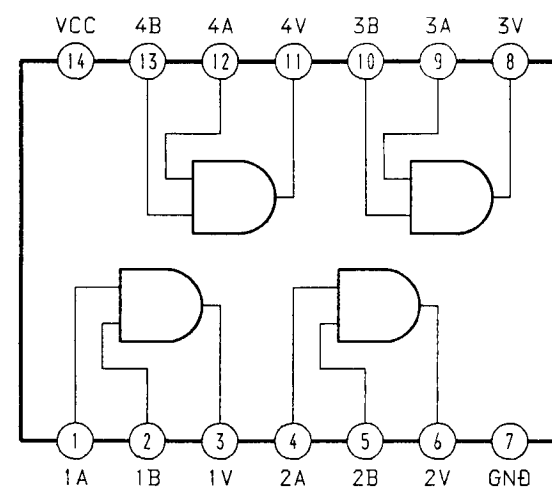
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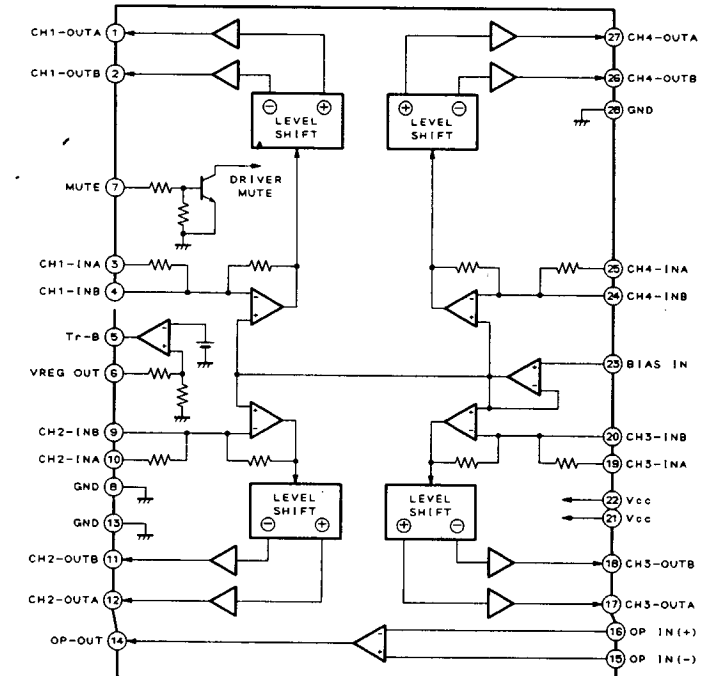
• Semiconductor Lead Layouts

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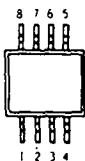
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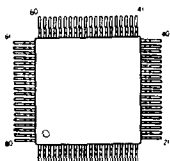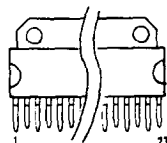
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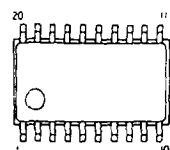
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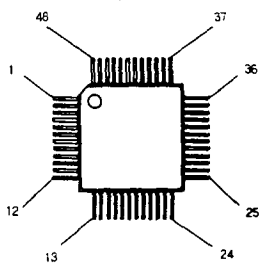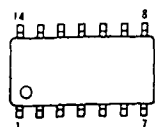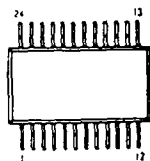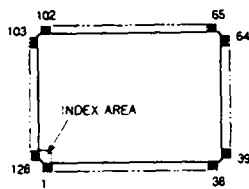
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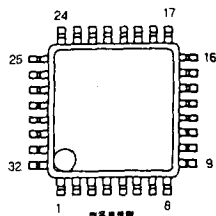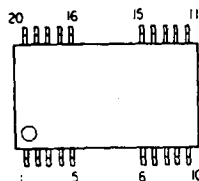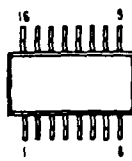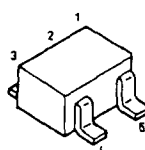
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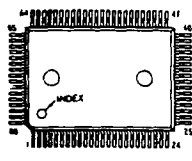
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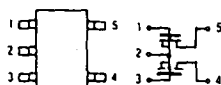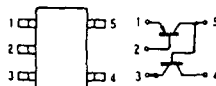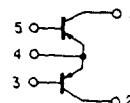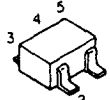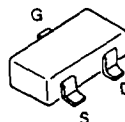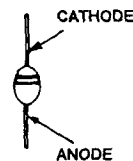
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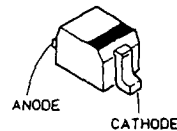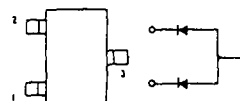
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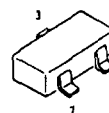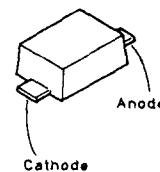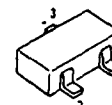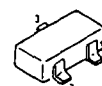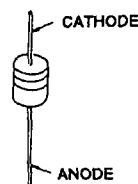
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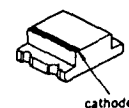
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(2) FRONT PANEL SECTION

LCD910

not supplied

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131 105
107 104
not supplied 104
116 117
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125
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102
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See page 57
17
101
121
120
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17

(4) MD SECTION-2

M903

205

#20

206

#17   #17

210

203

207

204

203

203

209

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201

202